Saskatchewan
Research Council

SASKATOON SRC
CLIMATOLOGICAL REFERENCE STATION
ANNUAL SUMMARY, 1986

by

E.E. Wheaton
R.M. Begrand

SRC Technical Report No. 192

Publication E-906-2-B-87 January, 1987

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Darlene Diduck provided the word processing for this report.

Enquiries concerning the climatological reference station data and its measurement programs are welcome. For further information, please contact:

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ABSTRACT

Data concerning temperature, precipitation, soil temperature, evaporation, wind speed, bright sunshine and solar radiation at Saskatoon SRC Climatological Reference Station (52°09'N, 106°36'W, 497 m MSL) are presented for the year 1986 and compared with the historic and standard period (1951 to 1980) records.

This year's weather was characterized by alternate warm and cold conditions in general, with each season having both warmer and colder than normal months. The particularly colder than normal months were February, July, September and November while January, March, May, October and December had warmer than normal conditions. This combination produced an above normal mean annual temperature.

This year's precipitation climate has also been variable, with each season having both wetter and drier than normal months. Although there were five months with drier than normal conditions, the total annual precipitation was greater than normal, and considerably greater than last year's total.

This climatic environment provided an erratic resource for agriculture in the Saskatoon area. Suitable spring temperature and moisture conditions permitted adequate germination and early growth of crops. Except for a wet, cool July and a dry August, the rest of summer was fairly normal. Then harvest was made difficult by the wet and cold conditions in September, especially for the crops whose maturity was slowed by the cool and wet July.

In summary, the year was warmer and wetter than usual, however, several colder and several drier months provided considerable variety.

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HISTORY AND STATION LOCATION

The first meteorological observations appear to have been taken at or near Saskatoon by the Royal Northwest Mounted Police in 1889. At first only temperatures were recorded. There were a number of changes made in the coordinates and as a result there is some disagreement in the early records as to the exact location of the weather observing point. The bulk of the evidence, however, indicates that the location was 52°15'N and 106°20'W, elevation 480 m above sea level. This would place it at Clark's Crossing, on the South Saskatchewan River, approximately 16 km north and east of the centre of the present City of Saskatoon. At that time there was a settlement at Clark's Crossing and also about 10 or 15 families on either side of the river at Saskatoon.

Not too much is known about the early observers. However, the records show that a Major T.H. Keenan took the observations from March, 1892 until March, 1895. Mr. George Will was the observer from January, 1897 until April, 1897. It is thought that Thomas H. Copeland was involved in the observational program from 1895 to May 1, 1901, at which time it was taken over by Mr. Eby, senior. Continuous observations were taken by the Eby's at a site on 8th Street until October 31, 1942, when the station was closed. Mr. Eby continued the program until his death in 1921. His daughter, Miss E.S. Eby, recorded the observations until April, 1931 and was replaced by her brother, J.M. Eby, who continued the program until the station was closed. The Eby station recorded temperature, precipitation and weather notes on fog, thunderstorms, winds and any unusual weather phenomena. Reports were made twice daily, morning and evening.

In 1916 a climatological station was established by the Physics De-

partment of the University of Saskatchewan and continuous observations were kept twice daily until January 15, 1965. The long time observer at this site was Mr. Sidney Cox. The Saskatchewan Research Council took over the program in the fall of 1963 at our newly established Climatological Reference Station.

The location of the Saskatchewan Research Council's Climatological Reference Station is latitude 52°09'N and longitude 106°36'W and the elevation is 497 m above mean sea level*. The long time observer (16 years) at this present site was Mr. Joe Calvert, who retired from the program in August, 1983. The present regular observers are Ray Begrand, Rolf Jahren, Brett Smith, James Ross, and Bob MacPherson.

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*From various sources including the Physical Environment of Saskatoon, Canada (E.A. Christiansen ed. 1970) and 1974 Annual Meteorological Summary, Saskatoon, Saskatchewan, Environment Canada, Atmospheric Environment Service.

FOOTNOTES TO CLIMATIC TABLES 1 TO 13

1 The quantities recorded in this column of Table 1 are defined as the element value for the reported year minus the element value for the previous year. The 1986 mean annual temperature was 3.2°C while the 1985 mean annual temperature was 1.1°C, giving a difference of 2.1°C. In 1986 there were 200 days with frost, two more days than for 1985.

2 In climatology it is often useful to make spatial comparisons of particular element values over a common time period. At an interior continental site such as Saskatoon, a period of 30 years is required to produce statistically stable estimates of the more variable elements. To facilitate spatial comparisons, World Meteorological Organization currently recommends the standard period January 1, 1951 to December 31, 1980 for data analysis. Items in this column conform to this standard, except where noted. Extreme values in this column are the extremes recorded in the standard period at Saskatoon SRC.

3 Temporal comparisons at a point are also of value in some types of climatic studies. Therefore it is desirable to produce the maximum length of reliable climatic record to carry out studies over a period of time. Data in this column are drawn from the following data sets:

Saskatoon SRC	1964 to 1985
Saskatoon U. of S.	1916 to 1963
Saskatoon	1892 to 1915

Station locations, exposures and measurement procedures were subject to change during this time period. Data presented in this column are unadjusted and users are cautioned accordingly.

4 The mean annual temperature is defined as the average of the daily mean temperatures for one year. In the monthly summaries (Tables 2 to 13) the daily mean temperature reported is the average of the daily mean temperatures for one month under consideration. In turn, the daily mean temperature for a particular day is defined as the arithmetic mean of the daily maximum temperature and the daily minimum temperature for the date. The normal records used for comparison purposes are those published in Volume Two of the Atmospheric Environment Service publication "Canadian Climate Normals, 1951-1980, Temperature".

5 The mean maximum temperature tabulated is the mean of the daily maximum temperatures for one year in the case of Table 1 and for particular months in the cases of Tables 2 to 13. For details concerning measurement procedures, the reader is referred to the Atmospheric Environment Service publication Manual of Climatological Observations, second edition, January, 1978. The normal values are published in Volume Two of the Canadian Climate Normals (note 4).

6 The mean minimum temperature as tabulated is defined as the mean of the daily minimum temperatures averaged over the appropriate time periods. Refer to note 5 above concerning measurement procedures and normals.

7 The word "extreme" refers to the highest or lowest value of a particular element recorded during the period in question. The highest temperature recorded at Saskatoon SRC during 1986 was 33.5°C while the highest value ever recorded at Saskatoon was 40.0°C (see Table 1).

8 A day with frost is recorded on each occasion when the daily minimum temperature is equal to or less than 0°C.

9 A heating degree-day (HDD) is an index of the heating requirement to achieve a stipulated comfort value in an indoor environment. For most purposes, a temperature of less than 18°C is considered uncomfortable and supplementary heating is required. On a specific day, the amount by which 18°C exceeds the daily mean temperature defines the number of heating degree-days for that day. Mathematically:

$$HDD = (18°C - \overline{T}), \text{ for that day,}$$
where $\overline{T}$ = daily mean temperature in °C
If $\overline{T}$ is equal to or greater than 18°C, HDD = 0.

Monthly and annual values of HDD are obtained by summing daily values. The normal used for comparison purposes is the adjusted normal published in the Atmospheric Environment Service publication Volume Four of the "Canadian Climate Normals, 1951-1980, Degree Days". The procedure used to adjust the means for stations with five to nineteen years of data is indicated in this volume. An adjustment is required to make the mean comparable to the thirty year normal.

10 In order for plant growth to proceed, air temperature must exceed a critical value appropriate to the plant species in question. For many members of the grass family, including most commercial cereals grown on the prairies, a base temperature of 5.0°C has been established. On a specified day, the difference between the daily mean temperature and the 5.0°C base temperature defines the number of growing degree-days (GDD). Mathematically:

$$GDD = (\overline{T} - 5.0°C), \text{ for that day,}$$
where $\overline{T}$ = daily mean temperature in °C
If $\overline{T}$ is equal to or greater than 5.0°C, GDD = 0.

Daily GDD values are summed to provide totals for the appropriate month, growing season or year. The normal value used for comparison is given in Volume Four of the "Canadian Climate Normals, 1951-1980, Degree Days".

11 Total precipitation is the sum of the daily rainfall and daily snowfall amounts recorded. The snowfall component of precipitation is recorded as an equivalent amount of liquid water. For particulars on precipitation measurement procedures and instruments, the reader is referred to the Atmospheric Environment Service publication Manual of Climatological Observations, second edition, January, 1978. The notation T in this column refers to a trace of precipitation (less than 0.2 mm water equivalent). The normal records used for comparison purposes are those published in Volume Three of the Atmospheric Environment Service publication "Canadian Climate Normals, Precipitation, 1951-1980".

12 Note that prior to 1960, measurement of snowfall was accomplished using snow rulers set vertically in the ground to obtain the thickness of the newly deposited layer. In obtaining precipitation values a standard water equivalent of one inch of snow yielding one-tenth inch of water was assumed. Since these measurements were inaccurate due to snow drifting, compaction and varying water equivalent, the Nipher snow gauge which actually catches snow has been employed at a number of stations (including Saskatoon SRC) in more recent years.

13 A precipitation day is recorded on occasions when the amount of precipitation in a 24-hour period equals or exceeds 0.2 mm water (0.01 inch in English units). If both rain and snow occur on the same day, a snow day, a rain day and a precipitation day are all recorded. If only one form of precipitation occurs on a specified date, a precipitation day, a rain day or a snow day are recorded appropriately. Beginning in 1974, observations at Saskatoon SRC refer to the calendar day. Previous to 1974, the so-called climatological day, beginning at 9 a.m. standard time on the date of reference and ending at 9 a.m. the next morning, was employed in record-keeping. An asterisk (*) appearing in the normal column denotes the occurrence of measurable precipitation on one or more occasions but the 30-year mean when calculated amounts to less than a trace.

14 Evaporation measurements are carried out in the period May 1 to September 30 only, using the International Hydrological Decade class A pan. The data reported is the sum of the daily net evaporation. Particulars of the measurement procedure are contained in the Atmospheric Environment Service publication "Evaporation", May, 1978. The data base available for comparison is the Saskatoon SRC record for the period 1964 to 1980. The notation M refers to missing data.

15 The mean wind speed value reported is the mean of the hourly wind speeds for the period in question. Average hourly wind speeds are obtained from recording instruments. The anemometer employed is a propeller-type aerofoil at a height of 10 m. Normals used for comparison purposes are those of Saskatoon Airport, from the Atmospheric Environment Service publication "Canadian Normals, Volume 5, Wind 1951-1980".

16 Peak gust refers to the highest instantaneous value recorded by the anemometer system for the period of reference, irrespective of direction and/or duration. Comparison is again with published data for Saskatoon Airport.

17 Total bright sunshine is the sum of the daily bright sunshine values in hours and tenths of hours as recorded by a Campbell-Stokes sunshine recorder. Atmospheric Environment Service publication, "Bright Sunshine, 1951-1980", Volume 7 supplies information on measurement procedures and normals respectively.

18 Percent possible bright sunshine hours refers to the ratio of measured bright sunshine hours to total possible daylight hours in a given period, expressed as a percentage.

19 Total global solar radiation is the sum of the daily values of short wave solar radiation recorded during the period in question. Measurements are carried out on a horizontal surface at the ground and integrated over the whole celestial dome, summing the diffuse and direct components of the solar beam. The measuring instrument is a temperature-compensated Eppley pyranometer. The standard metric unit of measurement is the magajoule per square metre ($MJ\ m^{-2}$). (To facilitate comparison with past years' data: 1.0 $MJ\ m^{-2}$ = 23.895 langleys). Comparison is provided with a provisional normal based on six years of data (1975-1980). Diffuse solar radiation is also recorded (Table 26). The instrument used is an Eppley pyranometer with a shade ring.

20 The year/day entry appearing in Tables 2 to 13 refers to the year and day on which an extreme event occurred. Reference to the month appears in the table heading. For example, referring to Table 2, the warmest day in January, 1986 was the 11th with a high temperature of 7.0°C while the warmest January day on record was January 30, 1931 with a high temperature of 10.0°C.

21 Due to missing observations, faulty instrument calibration, lost records, etc., only partial data are available especially during the period 1892 to 1915. The number of years of useful record is therefore cited.

22 Soil temperature, under a short grass surface with normal snow accumulation, is measured according to procedures outlined in the Atmospheric Environment Service publication "Soil Temperature", January 1, 1976. Depths below surface at which soil temperature measurements are made are: 5 cm, 10 cm, 20 cm, 50 cm, 100 cm, 150 cm and 300 cm. Since soil temperature is affected by profile structure and water content, extrapolation of the measured data is difficult.

Table 1. Annual Climatic Summary, Saskatoon SRC, 1986.

Element	1986 Value	Difference Between 1986 and 1985 Values[1]	Difference Between 1986 and Normal Values[2]	Difference Between 1986 Value and Value From All Years[3]
Mean Annual Temperature[4] (°C)	3.2	2.1	1.4	
Mean Maximum Temperature[5] (°C)	9.0	2.1	1.5	
Mean Minimum Temperature[6] (°C)	-2.6	2.2	1.4	
Extreme Maximum Temperature[7] (°C)	33.5 (May, Aug.)	-3.5	-3.2	-6.5
Extreme Minimum Temperature[7] (°C)	-38.5 (Feb.)	0.0	5.9	11.5
Days with Frost[8]	200	2.0	1	
Heating Degree-Days[9] (18°C base)	5434	-762	-595.1	
Growing Degree-Days[10] (5°C base)	1589	150	-46.9	
Total Precipitation[11] (mm)	412.1	81.5	41.6	
Total Rainfall[11] (mm)	329.9	78.4	86.9	
Total Snowfall[12] (cm)	82.2	3.1	-35.8	
Greatest 24-hr Precipitation (mm)	23.5 (Aug.)	-16.4	-22.0	-75.9
Greatest 24-hr Rainfall (mm)	23.5 (Aug.)	-16.4	-22.0	-75.9
Greatest 24-hr Snowfall (cm)	11.5 (Mar.)	1.5	-20.5	-25.2
Precipitation Days[13]	97	-8	-19.0	
Rainfall Days[13]	67	9	8	
Snowfall Days[13]	30	-18	-32	
Total Evaporation[14] (mm)	1004 (May-Sept.)	109.9	21.4	
Mean Wind Speed[15] (km/hr)	13.2	-0.8	-4.3	
Peak Wind Gust[16] (km/hr)	109 (Jan.)	-51.0	-42	
Total Bright Sunshine[17] (hr)	2063.9	-200.8	-385.8	
Total Global Radiation[19] (MJ m^{-2})	4250.8	-210.6	-228.3	
Total Diffuse Radiation[19] (MJ m^{-2})	1665.9	-91.9	--	

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
JANUARY, 1986

Table 2.

Element	1986 Value	1985 Value	Mean or Extreme 1951-19[illegible]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	-8.6	-15.4	-19.1	
Monthly Mean Maximum Temperature[5] (°C)	-3.6	-8.8	-14.2	
Monthly Mean Minimum Temperature[6] (°C)	-13.5	-21.9	-23.9	
Extreme Maximum Temperature[7] (°C)	7.0	6.5	6.1	10.0
Year/Day(s)[20]	1986/11	1985/3	1968/23 & 1973/15	1931/30
Years of Record[21]	1	1	17	88
Extreme Minimum Temperature[7] (°C)	-25.5	-38.5	-43.9	-48.9
Year/Day(s)[20]	1986/6	1985/19	1966/22 & 1969/29	1893/31
Years of Record[21]	1	1	17	88
Days with Frost[8]	31	31	31	
Heating Degree-Days[9] (18°C base)	826.5	1041.0	1149.0	
Growing Degree-Days[10] (5°C base)	0.0	0.0	0.0	
Total Precipitation[11] (mm)	31.8	11.6	22.6	
Total Rainfall[11] (mm)	--	T	0.1	
Total Snowfall[12] (cm)	31.8	11.6	21.2	
Greatest 24-hour Precipitation (mm)	9.2	8.5	12.4	30.5
Year/Day(s)[20]	1986/17	1985/17	--	1893/23
Years of Record[21]	1	1	17	88
Greatest 24-hour Rainfall (mm)	--	T	1.8	2.0
Year/Day(s)[20]	--	1985/12	--	1947/10
Years of Record[21]	1	1	17	88
Greatest 24-hour Snowfall (cm)	9.2	8.5	12.4	30.5
Year/Day(s)[20]	1986/17	1985/17	--	1893/23
Years of Record[21]	1	1	17	88
Precipitation Days[13]	6	5	13	9
Rainfall Days[13]	0	*	*	1
Snowfall Days[13]	6	5	13	9
Total Evaporation[14] (mm)	--	--	May-Sept.	
Mean Wind Speed[15] (km/hr)	13.7	13.5	16.8	
Peak Gust Speed[16] (km/hr)	109.0	69.0	97.0	
Total Bright Sunshine[17] (hr)	84.5	91.3	103.0	
Percent Possible Bright Sunshine[18]	33	36	40	
Total Global Radiation[19] (MJ m^{-2})	114.1	137.7	132.6	
Total Diffuse Radiation[19] (MJ m^{-2})	66.3	74.3	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	-4.9, -2.8	-7.7, -5.3	-8.7, -3.8	
Mean Soil Temperature[22] (°C) (150, 300 cm)	0.7, 3.4	0.6, 4.4	2.1, 4.5	

SUMMARY:

January, 1986 becomes the warmest January since 1893 with a record mean temperature of -8.6°C. The previous record warm January occurred in 1931 (-9.0°C). Extreme temperatures ranged from a maximum of 7.0°C (on the 11th) to a minimum of -25.5°C (on the 6th). Above normal temperatures were recorded on 29 of 31 days, and 25 of the 29 days were consecutive. In addition, extreme maximum records for the day were broken on the 11th and 14th when temperatures reached 7°C and 6°C. The extreme of 7°C exceeded the extreme record at CRS during its operation in the normal period (1964-1980).

The total precipitation of 31.8 mm is 41% greater than the normal (22.6 mm). Precipitation consisted of snow with a trace of rain and the largest 24 hour snowfall occurred on the 17th when 9.2 cm fell. The average snow depth at the end of January was 8 cm. Above normal temperatures reduced snow cover to a trace from January 9th to the 17th.

Milder temperatures have resulted in 28% fewer heating degree-days as compared to the normal and soil temperatures at all seven levels remain above normal for this time of the year.

The mean wind speed recorded at CRS (13.7 km/hr) was below average for the month, although a peak gust speed of 109 km/hr recorded on the 11th, surpassed the extreme of 97 km/hr. The severe wind speeds on this date caused varying degrees of damage throughout the city and surrounding rural areas.

January, 1986 now becomes the warmest on record since 1893. Above normal temperatures and precipitation have made January a warm and wet month. Although precipitation amounts have surpassed the normal, more snow would be required to replenish soil moisture in many agricultural areas.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
FEBRUARY, 1986

Table 3.

Element	1986 Value	1985 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	-15.8	-17.0	-14.5	
Monthly Mean Maximum Temperature[5] (°C)	-10.9	-11.5	-9.3	
Monthly Mean Minimum Temperature[6] (°C)	-20.7	-22.5	-19.7	
Extreme Maximum Temperature[7] (°C)	6.5	6.0	6.1	12.8
Year/Day(s)[20]	1986/25	1985/28	1968/29	1931/19
Years of Record[21]	1	1	17	90
Extreme Minimum Temperature[7] (°C)	-38.5	-37.0	-41.1	-50.0
Year/Day(s)[20]	1986/20	1985/283	1972/6	1893/1
Years of Record[21]	1	1	17	90
Days with Frost[8]	28	28	28	
Heating Degree-Days[9] (18°C base)	949.5	1018.5	920.4	
Growing Degree-Days[10] (5°C base)	0.0	0.0	0.0	
Total Precipitation[11] (mm)	11.6	23.1	21.9	
Total Rainfall[11] (mm)	0.0	0.0	0.4	
Total Snowfall[12] (cm)	11.6	23.1	18.5	
Greatest 24-hour Precipitation (mm)	8.6	10.0	14.2	20.3
Year/Day(s)[20]	1986/16	1985/24	1979/13	1918/7
Years of Record[21]	1	1	17	89
Greatest 24-hour Rainfall (mm)	0.0	0.0	1.8	8.1
Year/Day(s)[20]	--	--	1968/26	1953/3
Years of Record[21]	1	1	17	90
Greatest 24-hour Snowfall (cm)	8.6	10.0	14.2	20.3
Year/Day(s)[20]	1986/16	1985/24	1979/13	1918/7
Years of Record[21]	1	1	17	89
Precipitation Days[13]	6	9	11	
Rainfall Days[13]	0	0	*	
Snowfall Days[13]	6	9	10	
Total Evaporation[14] (mm)	--	--	--	
Mean Wind Speed[15] (km/hr)	9.5	12.9	16.4	
Peak Gust Speed[16] (km/hr)	59.0	72.0	85.0	
Total Bright Sunshine[17] (hr)	125.0	100.2	135.1	
Percent Possible Bright Sunshine[18]	45.6	36.6	49.0	
Total Global Radiation[19] (MJ m^{-2})	222.9	219.2	232.9	
Total Diffuse Radiation[19] (MJ m^{-2})	111.0	119.6	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	-7.8, -4.3	-9.0, -5.7	-7.3, -4.1	
Mean Soil Temperature[22] (°C) (150, 300 cm)	0.4, 2.7	-0.6, 3.1	1.0, 3.2	

SUMMARY:

The monthly mean temperature was 1.3°C below the normal. Below normal temperatures were recorded at CRS on 17 consecutive days between the 7th and 23rd. During this period minimum temperatures ranged from -22°C to -38°C. Above normal temperatures were recorded at CRS during the first six and last five days of the month when daily maxima ranged from -10°C to 6.5°C.

The total monthly precipitation was only 60.6% of the 1951-1980 average. Precipitation consisted of snow, with approximately 75% of the total falling in a 24 hour period on the 16th. Above normal temperatures at the end of the month have reduced snow cover to aproximately 3 cm at the Climate Reference Station. The October, 1985 - February, 1986 precipitation (73.2 mm) was substantially below the normal of 103.8 mm for the same period.

Bright sunshine (125.0 hrs) and mean wind speed (9.5 km/hr) were both below normal values.

Colder than normal temperatures were also reflected in a 3% greater than normal number of heating degree days being recorded. Soil temperatures at all seven levels were slightly below normal (.1°-.6°).

Although the severe cold spell resulted in below average temperatures, the warm spells did provide a definite sugoestion of spring. The warm spells also caused a reduction in the already shallow snow cover.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
MARCH, 1986

Table 4.

Element	1986 Value	1985 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	-1.0	-4.3	-8.5	
Monthly Mean Maximum Temperature[5] (°C)	4.0	0.4	-3.5	
Monthly Mean Minimum Temperature[6] (°C)	-5.9	-9.0	-13.6	
Extreme Maximum Temperature[7] (°C)	17.0	6.0	15.0	22.8
Year/Day(s)[20]	1986/27	1985/20	1973/24	1910/23
Years of Record[21]	1	1	17	90
Extreme Minimum Temperature[7] (°C)	-20.0	-20.0	-38.9	-43.3
Year/Day(s)[20]	1986/9	1985/2	1972/2	1897/14
Years of Record[21]	1	1	17	90
Days with Frost[8]	27	31	31	
Heating Degree-Days[9] (18°C base)	587.0	683.5	826.0	
Growing Degree-Days[10] (5°C base)	12.5	0.0	0.9	
Total Precipitation[11] (mm)	20.3	11.1	22.3	
Total Rainfall[11] (mm)	2.1	T	1.1	
Total Snowfall[12] (cm)	18.2	11.1	19.5	
Greatest 24-hour Precipitation (mm)	11.5	7.4	32.0	32.0
Year/Day(s)[20]	1986/24	1985/22	1967/30	1967/30
Years of Record[21]	1	1	17	85
Greatest 24-hour Rainfall (mm)	1.3	T	5.6	7.4
Year/Day(s)[20]	1986/28	1985/24	1968/3	1938/28
Years of Record[21]	1	1	17	90
Greatest 24-hour Snowfall (cm)	11.5	7.4	32.0	32.0
Year/Day(s)[20]	1986/24	1985/22	1967/30	1967/30
Years of Record[21]	1	1	17	85
Precipitation Days[13]	7	5	10	
Rainfall Days[13]	2	1	1	
Snowfall Days[13]	5	5	10	
Total Evaporation[14] (mm)	--	--	(May-Sept.)	
Mean Wind Speed[15] (km/hr)	13.2	14.2	17.5	
Peak Gust Speed[16] (km/hr)	77.0	58.0	93.0	
Total Bright Sunshine[17] (hr)	126.3	205.8	190.0	
Percent Possible Bright Sunshine[18]	35	56	52	
Total Global Radiation[19] (MJ m^{-2})	299.4	423.6	422.9	
Total Diffuse Radiation[19] (MJ m^{-2})	177.9	149.3	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	-0.1, -0.5	-2.3, -2.5	-3.5, -2.1	
Mean Soil Temperature[22] (°C) (150, 300 cm)	0.1, 2.2	-0.7, 2.0	0.5, 2.5	

SUMMARY:

March, 1986 was the third warmest March on record since 1892 with a mean temperature of -1.0°C. The two previous warmest Marchs occurred in 1910 (0.2°C) and 1959 (-0.9°C). The mean temperature recorded at CRS was 7.5°C above the 1951-1980 normal (-8.5°C). Daily maxima ranged from -11°C to 17°C while minima ranged from -20°C to 2°C. Three days without frost were recorded at CRS on the 27, 28, and 30th. Records for daily maximum temperatures were surpassed on the 27th and 30th when maximum temperatures of 17.0°C and 15.0°C respectively were recorded. Above normal temperatures were recorded on 28 of 31 days, while only three days with below normal temperatures were recorded sporadically through the month.

Total precipitation (20.3 mm) recorded by CRS was slightly below normal primarily due to the below normal snowfall. The warm temperatures had eliminated the snow cover with the exception of two short lived accumulations recorded on the 8-10th (2 cm) and on the 25-26th (5-6 cm).

Bright sunshine hours and heating degree days were both below the 1951-1980 normal values.

Soil temperatures were above normal with the exception of slightly below normal temperatures at the 150 and 300 cm depths. As of the end of the month, soil temperatures at all depths except the 100 cm level, were above freezing temperature.

March was warm and moist with above normal temperatures and near normal precipitation. The first month of spring has provided a warm end to a generally mild winter.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
APRIL, 1986

Table 5.

Element	1986 Value	1985 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	3.3	5.4	3.4	
Monthly Mean Maximum Temperature[5] (°C)	9.7	10.1	9.0	
Monthly Mean Minimum Temperature[6] (°C)	-3.2	0.6	-2.3	
Extreme Maximum Temperature[7] (°C)	21.5	20.5	30.6	33.0
Year/Day(s)[20]	1986/9	1985/13	1977/26	1952/28
Years of Record[21]	1	1	17	89
Extreme Minimum Temperature[7] (°C)	-14.0	-7.5	-27.8	-28.3
Year/Day(s)[20]	1986/12	1985/6	1979/1	1893/1954
Years of Record[21]	1	1	17	89
Days with Frost[8]	25	14	22	
Heating Degree-Days[9] (18°C base)	439.0	377.5	440.0	
Growing Degree-Days[10] (5°C base)	36.5	54.5	47.0	
Total Precipitation[11] (mm)	6.2	55.9	21.4	
Total Rainfall[11] (mm)	5.4	46.8	10.7	
Total Snowfall[12] (cm)	0.8	9.1	10.0	
Greatest 24-hour Precipitation (mm)	1.8	24.6	19.3	30.2
Year/Day(s)[20]	1986/16&17	1985/19	1968/20	1955/19
Years of Record[21]	1	1	17	89
Greatest 24-hour Rainfall (mm)	1.8	24.6	11.7	26.7
Year/Day(s)[20]	1986/16&17	1985/19	1964/25	1926/23
Years of Record[21]	1	1	17	89
Greatest 24-hour Snowfall (cm)	0.8	3.6	18.0	20.3
Year/Day(s)[20]	1986/2	1985/16	1968/20	1942/5
Years of Record[21]	1	1	17	89
Precipitation Days[13]	6	8	7	
Rainfall Days[13]	5	5	5	
Snowfall Days[13]	1	3	4	
Total Evaporation[14] (mm)	--	--	(May-Sept.)	
Mean Wind Speed[15] (km/hr)	14.9	16.6	19.0	
Peak Gust Speed[16] (km/hr)	70	77	108	
Total Bright Sunshine[17] (hr)	200	206	232	
Percent Possible Bright Sunshine[18]	48	50	56	
Total Global Radiation[19] (MJ m^{-2})	466	450	519	
Total Diffuse Radiation[19] (MJ m^{-2})	203	155	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	4.6, 2.6	4.4, 2.1	4.0, 2.0	
Mean Soil Temperature[22] (°C) (150, 300 cm)	0.9, 2.0	0.5, 2.0	0.9, 2.1	

SUMMARY:

The April mean daily temperature (3.3°C) was very near normal. Above normal temperatures were recorded on 15 of 30 days, while below normal temperatures were recorded on the other 15 days. Above and below normal temperatures occurred sporadically throughout the month. An extreme maximum temperature of 21.5°C was recorded on the 9th, while the extreme minimum (-14.0°C) was recorded three days later on the 12th.

Bright sunshine hours (200.3) recorded at CRS were 86% of the normal. Heating degree days were slightly below normal values but growing degree days were only 78% of normal.

Total precipitation (6.2 mm) recorded was only 29% of the thirty year normal (21.4 mm) for Saskatoon SRC. The total precipitation consisted of 5.4 mm of rain and 0.8 cm of snow. Additional snow was recorded in the form of traces on four other occasions. The April, 1986 precipitation (5.2 mm) was a sharp contrast to the 55.9 mm recorded at CRS in April, 1985. The January to April total precipitation (69.9 mm) has fallen 18.3 mm below the 1951-1980 normal of 88.2 mm for the same period.

Soil temperatures varied only slightly from the normal. At the 5-50 cm levels temperatures were above normal (by 0.6°-1.0°) and at the 100-300 cm depths temperatures were normal.

April was somewhat cool and cloudy but quite dry, with near normal temperatures, and below normal precipitation.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
MAY, 1986

Table 6.

Element	1986 Value	1985 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	12.7	12.9	11.2	
Monthly Mean Maximum Temperature[5] (°C)	19.4	19.4	18.1	
Monthly Mean Minimum Temperature[6] (°C)	6.0	6.4	4.3	
Extreme Maximum Temperature[7] (°C)	33.5	28.0	34.0	37.2
Year/Day(s)[20]	1986/29	1985/4	1980/21	1936/27
Years of Record[21]	1	1	17	89
Extreme Minimum Temperature[7] (°C)	-4.0	1.5	-10.0	-12.8
Year/Day(s)[20]	1986/1	1985/19	1967/2	1907/6
Years of Record[21]	1	1	17	89
Days with Frost[8]	7	0	6	
Heating Degree-Days[9] (18°C base)	190.5	160.0	216.0	
Growing Degree-Days[10] (5°C base)	246.0	247.0	199.0	
Total Precipitation[11] (mm)	56.0	67.3	39.6	
Total Rainfall[11] (mm)	56.0	67.3	37.7	
Total Snowfall[12] (cm)	T	0.0	1.8	
Greatest 24-hour Precipitation (mm)	18.4	39.9	33.8	51.3
Year/Day(s)[20]	1986/9	1985/4	1975/19	1909/30
Years of Record[21]	1	1	17	89
Greatest 24-hour Rainfall (mm)	18.4	39.9	33.8	51.3
Year/Day(s)[20]	1986/9	1985/4	1975/19	1909/30
Years of Record[21]	1	1	17	89
Greatest 24-hour Snowfall (cm)	T	0.0	4.3	26.2
Year/Day(s)[20]	1986/9,14,15	--	1969/14	1983/10
Years of Record[21]	1	1	17	89
Precipitation Days[13]	9	11	7	
Rainfall Days[13]	9	11	1	
Snowfall Days[13]	0	0	7	
Total Evaporation[14] (mm)	222	182	208.7	
Mean Wind Speed[15] (km/hr)	17.7	13.4	19.4	
Peak Gust Speed[16] (km/hr)	57	81	132	
Total Bright Sunshine[17] (hr)	243	270	292	
Percent Possible Bright Sunshine[18]	50	56	60	
Total Global Radiation[19] (MJ m^{-2})	580	556	659	
Total Diffuse Radiation[19] (MJ m^{-2})	199	221	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	11.9, 8.5	13.2, 9.4	12.3, 8.8	
Mean Soil Temperature[22] (°C) (150, 300 cm)	4.2, 3.0	4.6, 3.0	4.1, 2.9	

SUMMARY:

The mean temperature of 12.7°C was 1.5°C above the normal. Above normal temperatures were recorded at the Climate Reference Station on 17 of 31 days, 14 of which were consecutive during the latter half of the month. Mean daily temperatures during the first half of the month were primarily below normal. While temperatures reached a maximum of 33.5°C (0.5°C below the extreme for the 29th), record temperatures were not surpassed.

The last spring frost recorded at CRS was May 17 (-2.0°C) as compared to the average last frost date of May 23rd.

Total precipitation (56.0 mm) recorded was 16.4 mm above the 1951-1980 normal. Precipitation consisted of rain with only traces of snow recorded on three occasions. The total annual precipitation to the end of May (125.9 mm) was only 1.9 mm below the average.

The mean wind speed (17.7 km/hr) recorded at CRS fell slightly below the normal (19.4 km/hr).

Evaporation measured from the Class A pan (221.0 mm) was 12 mm greater than normal.

Soil temperatures at the 5 to 50 cm levels were only slightly below normal (.1-.4°), while temperatures at the 100-300 cm depths were only slightly above normal (.1-.3°).

Above normal temperatures during the month have resulted in the recording of 12% fewer heating degree days than normal, and 24% greater than normal growing degree days.

May temperatures and precipitation have been above normal providing enough moisture and heat for most crops to germinate and flourish in the Saskatoon area.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY
JUNE, 1986

Table 7.

Element	1986 Value	1985 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	15.7	13.0	15.6	
Monthly Mean Maximum Temperature[5] (°C)	22.9	19.4	22.1	
Monthly Mean Minimum Temperature[6] (°C)	8.4	6.5	9.1	
Extreme Maximum Temperature[7] (°C)	31.5	29.0	35.6	40.0
Year/Day(s)[20]	1986/17	1985/19	1976/4	1900/21 & 1941/24
Years of Record[21]	1	1	17	90
Extreme Minimum Temperature[7] (°C)	3.5	-2.5	-3.3	-3.9
Year/Day(s)[20]	1986/14 & 16	1985/4	1967/6	1903/9 & 1917/2
Years of Record[21]	1	1	17	90
Days with Frost[8]	0	2	0	
Heating Degree-Days[9] (18°C base)	83.5	156.5	89.0	
Growing Degree-Days[10] (5°C base)	320.0	236.5	319.0	
Total Precipitation[11] (mm)	52.7	13.0	59.9	
Total Rainfall[11] (mm)	52.7	13.0	59.9	
Total Snowfall[12] (cm)	0	0	0	
Greatest 24-hour Precipitation (mm)	17.4	5.2	45.0	99.4
Year/Day(s)[20]	1986/18	1985/16	1970/10	1903/24
Years of Record[21]	1	1	17	90
Greatest 24-hour Rainfall (mm)	17.4	5.2	45.0	99.4
Year/Day(s)[20]	1986/18	1985/16	1970/10	1903/24
Years of Record[21]	1	1	17	90
Greatest 24-hour Snowfall (cm)	-	-	0.0	1.8
Year/Day(s)[20]	-	-	-	1938/29
Years of Record[21]	-	-	17	90
Precipitation Days[13]	12	10	11	
Rainfall Days[13]	12	10	11	
Snowfall Days[13]	0	0	0	
Total Evaporation[14] (mm)	239.1	191.5	210.3	
Mean Wind Speed[15] (km/hr)	13.8	16.1	18.2	
Peak Gust Speed[16] (km/hr)	90	96	101	
Total Bright Sunshine[17](hr)	287.2	266.2	294.0	
Percent Possible Bright Sunshine[18]	58	54	59	
Total Global Radiation[19] (MJ m^{-2})	652	613	683	
Total Diffuse Radiation[19] (MJ m^{-2})	216	257	-	
Mean Soil Temperature[22] (°C) (10, 50 cm)	17.8, 14.7	13.5, 12.2	17.5, 14.0	
Mean Soil Temperature[22] (°C) (150, 300 cm)	8.4, 5.1	7.6, 5.3	8.3, 5.2	

SUMMARY:

The mean temperature (15.7°C) recorded at CRS was slightly above normal (0.1°) for the month. Below normal mean temperatures were recorded on 19 of 30 days, while above normal temperatures were recorded on 11 of 30 days. Extreme temperatures recorded at CRS ranged between a maximum of 31.5°C to a minimum of 3.5°C.

Total precipitation (52.7 mm) was 7.2 mm below the 1951-80 normal. The greatest 24 hour precipitation (17.4 mm) was recorded on the 18th. Eight millimetres of that event fell within 5 minutes. The January-June total precipitation of 178.6 mm was 95% of the normal for the same period.

The mean windspeed of 13.8 km/hr (based on 27 days of data) was substantially below the normal of 18.2 km/hr. The peak gust recorded by CRS was 90 km/hr (on the 25th), however due to equipment malfunction, 3 days of wind data were not included. Extreme wind conditions were recorded during these 3 days (pers. Comm with Saskatoon Weather Office).

Soil temperatures were near normal (±0.1°) with the exception of the 20 cm level (1.0° above normal) and the 50 cm level (0.7 above normal).

June has been a warm and dry month with near normal temperatures and slightly below normal precipitation.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
JULY, 1986

Table 8.

Element	1986 Value	1985 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	17.1	17.8	18.4	
Monthly Mean Maximum Temperature[5] (°C)	23.2	25.3	25.2	
Monthly Mean Minimum Temperature[6] (°C)	10.9	10.3	11.6	
Extreme Maximum Temperature[7] (°C)	33.0	37.0	36.7	40.0
Year/Day(s)[20]	1986/2	1985/5	1964/12	1919/17; 1941/19
Years of Record[21]	1	1	17	90
Extreme Minimum Temperature[7] (°C)	4.5	5.5	1.7	-0.6
Year/Day(s)[20]	1986/7	1985/1	1967/2	1918/25
Years of Record[21]	1	1	17	90
Days with Frost[8]	0	0	0	
Heating Degree-Days[9] (18°C base)	36.0	39.0	32.8	
Growing Degree-Days[10] (5°C base)	378.5	402.0	416.3	
Total Precipitation[11] (mm)	115.8	59.5	56.2	
Total Rainfall[11] (mm)	115.8	59.5	56.2	
Total Snowfall[12] (cm)	0.0	0.0	0.0	
Greatest 24-hour Precipitation (mm)	17.2	30.4	45.5	79.2
Year/Day(s)[20]	1986/12	1985/17	1968/29	1946/3
Years of Record[21]	1	1	17	90
Greatest 24-hour Rainfall (mm)	17.2	30.4	45.5	79.2
Year/Day(s)[20]	1986/12	1985/17	1968/29	1946/3
Years of Record[21]	1	1	17	90
Greatest 24-hour Snowfall (cm)	0.0	0.0	0.0	0.0
Year/Day(s)[20]	--	--	--	--
Years of Record[21]	1	1	17	--
Precipitation Days[13]	18	7	11	
Rainfall Days[13]	18	7	11	
Snowfall Days[13]	0	0	0	
Total Evaporation[14] (mm)	200.3	241.0	230.1	
Mean Wind Speed[15] (km/hr)	13.2	11.4	16.7	
Peak Gust Speed[16] (km/hr)	72	160	105	
Total Bright Sunshine[17] (hr)	264.5	378.9	341.0	
Percent Possible Bright Sunshine[18]	53	76	68	
Total Global Radiation[19] (MJ m^{-2})	607	709.8	737	
Total Diffuse Radiation[19] (MJ m^{-2})	226	235.8	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	18.8, 16.5	19.9, 16.1	19.7, 16.9	
Mean Soil Temperature[22] (°C) (150, 300 cm)	10.7, 7.1	10.2, 7.1	11.4, 7.6	

SUMMARY:

The mean temperature of 17.1°C was 1.3°C below the normal monthly temperature. Below normal temperatures were recorded on 25 of 31 days, while normal or slightly above normal temperatures were recorded on 6 days. The minimum daily record temperature for the 7th was broken when a 4.5°C minimum temperature was recorded at CRS.

The monthly precipitation total (115.8 mm) greatly surpassed the 1951-1980 normal (56.2 mm) by 59.6 mm. The cumulative precipitation for January to July (294.4 mm) was 50.5 mm above the normal precipitation for the same period. Measurable precipitation (≥0.2 mm) was recorded on 18 of 31 days this month.

The mean wind speed (13.2 km/hr) was slightly below the normal (16.7 km/hr).

Mean soil temperatures at all seven depths were below normal (0.3°C - 1.3°C lower).

Total bright sunshine hours (264.5 hrs) as measured by the Campbell-Stokes recorder was substantially below both the normal (341.0 hrs) and the 1985 value (378.9 hrs).

July was cool and wet with slightly below normal temperatures and well above normal precipitation.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
AUGUST, 1986

Table 9.

Element	1986 Value	1985 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	17.1	15.1	17.2	
Monthly Mean Maximum Temperature[5] (°C)	24.6	22.6	24.2	
Monthly Mean Minimum Temperature[6] (°C)	9.6	7.6	10.2	
Extreme Maximum Temperature[7] (°C)	33.5	32.5	36.7	37.8
Year/Day(s)[20]	1986/29	1985/25	1970/7	1893/6, 1949/6
Years of Record[21]	1	1	17	89
Extreme Minimum Temperature[7] (°C)	1.0	0.5	-2.8	-2.8
Year/Day(s)[20]	1986/26	1985/27	1976/28	1976/28
Years of Record[21]	1	1	17	89
Days with Frost[8]	0	0	0	
Heating Degree-Days[9] (18°C base)	61.0	97.5	60.1	
Growing Degree-Days[10] (5°C base)	378.0	319.5	378.7	
Total Precipitation[11] (mm)	27.7	19.3	35.1	
Total Rainfall[11] (mm)	27.7	19.3	35.1	
Total Snowfall[12] (cm)	0.0	0.0	0.0	
Greatest 24-hour Precipitation (mm)	23.5	7.0	24.6	73.7
Year/Day(s)[20]	1986/5	1985/8	1968/18	1945/3
Years of Record[21]	1	1	17	89
Greatest 24-hour Rainfall (mm)	23.5	7.0	24.6	73.7
Year/Day(s)[20]	1986/5	1985/8	1968/18	1945/3
Years of Record[21]	1	1	17	89
Greatest 24-hour Snowfall (cm)	0.0	0.0	0.0	0.0
Year/Day(s)[20]	--	--	--	--
Years of Record[21]	1	1	17	
Precipitation Days[13]	5	8	10	
Rainfall Days[13]	5	8	10	
Snowfall Days[13]	0	0	0	
Total Evaporation[14] (mm)	251.0	185.8	201.4	
Mean Wind Speed[15] (km/hr)	10.2	13.5	16.5	
Peak Gust Speed[16] (km/hr)	60	129	151	
Total Bright Sunshine[17] (hr)	295.3[e]	296.6	293.0	
Percent Possible Bright Sunshine[18]	65	65	65	
Total Global Radiation[19] (MJ m^{-2})	578.1	563.1	605.0	
Total Diffuse Radiation[19] (MJ m^{-2})	158.6	196.5	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	18.2, 16.8	15.7, 16.0	18.4, 16.7	
Mean Soil Temperature[22] (°C) (150, 300 cm)	12.0, 8.7	11.4, 8.6	12.6, 9.3	

SUMMARY:

The mean monthly temperature of 17.1°C was only 0.1°C below the thirty year normal. Normal mean temperatures were recorded on 3 of 31 days, while above and below normal temperatures were each recorded on 14 of 31 days. Frost has not been recorded yet, however, an extreme minimum of 1.0°C was recorded on the 26th. The extreme maximum (33.5°C) was recorded on the 29th.

Total precipitation was only 78.9% of the monthly normal (35.1 mm). Eighty-five percent (23.5 mm) of the recorded precipitation fell within a 24-hour period on the 5th. The January-August cumulative precipitation of 322.1 mm still remains 43.1 mm above the 1951-1980 normal

Heating and growing degree days were both very near normal values.

Soil temperatures at the 5-10 cm and 100-300 cm levels were below normal (-0.2° to -0.6°) while temperatures at the 20 and 50 cm depths were slightly above normal values (0.1° to 0.3°).

August has been warm and relatively dry, with near normal temperatures and below normal precipitation.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
SEPTEMBER, 1986

Table 10.

Element	1986 Value	1985 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	9.2	8.6	11.5	
Monthly Mean Maximum Temperature[5] (°C)	14.1	13.7	17.8	
Monthly Mean Minimum Temperature[6] (°C)	4.3	3.5	5.1	
Extreme Maximum Temperature[7] (°C)	21.0	24.5	35.6	35.6
Year/Day(s)[20]	1986/2	1985/14	1978/4	1978/4
Years of Record[21]	1	1	16	87
Extreme Minimum Temperature[7] (°C)	-2.0	-6.0	-7.8	-11.1
Year/Day(s)[20]	1986/8	1985/29	1978/30	1908/28
Years of Record[21]	1	1	16	87
Days with Frost[8]	5	8	4	
Heating Degree-Days[9] (18°C base)	260.5	274.0	201.3	
Growing Degree-Days[10] (5°C base)	132.0	137.0	200.8	
Total Precipitation[11] (mm)	65.0	40.0	32.2	
Total Rainfall[11] (mm)	65.0	39.7	30.8	
Total Snowfall[12] (cm)	0.0	0.3	1.3	
Greatest 24-hour Precipitation (mm)	21.8	13.4	29.6	44.2
Year/Day(s)[20]	1986/20	1985/26	1980/3	1931/12
Years of Record[21]	1	1	16	87
Greatest 24-hour Rainfall (mm)	21.8	13.4	29.6	44.2
Year/Day(s)[20]	1986/20	1985/26	1980/3	1931/12
Years of Record[21]	1	1	16	87
Greatest 24-hour Snowfall (cm)	0.0	0.3	5.6	17.6
Year/Day(s)[20]	--	1985/22	1973/14	1982/28
Years of Record[21]	--	1	16	87
Precipitation Days[13]	11	12	9	
Rainfall Days[13]	11	11	9	
Snowfall Days[13]	0	1	1	
Total Evaporation[14] (mm)	91.6	93.8	124.1	
Mean Wind Speed[15] (km/hr)	13.4	14.3	18.1	
Peak Gust Speed[16] (km/hr)	89.0	76.0	148.0	
Total Bright Sunshine[17] (hr)	114.6	142.0	191.0	
Percent Possible Bright Sunshine[18]	30	37	50	
Total Global Radiation[19] (MJ m^{-2})	285.5	324.9	409.3	
Total Diffuse Radiation[19] (MJ m^{-2})	124.2	148.6	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	11.2, 13.0	10.5, 12.2	12.3, 13.2	
Mean Soil Temperature[22] (°C) (150, 300 cm)	11.7, 9.7	10.9, 9.1	12.1, 10.1	

SUMMARY:

The mean temperature of 9.2°C fell below the normal temperature (11.5°C) by 2.3°C. Below normal temperatures were recorded at CRS on 23 of 30 days, while the longest cool spell for the month lasted 11 days (11th-21st). Five days with frost were recorded, with the first fall frost occurring on the 6th when a minimum of 0.0°C was recorded. The frost on the 6th resulted in a 111 day frost free period.

The monthly precipitation (65.0 mm) was 32.8 mm above the normal (32.2 mm). Measurable precipitation (>0.2 mm) was recorded on 11 of 30 days, while the largest 24 hour precipitation event (21.8 mm) occurred on the 20th. The January-September total precipitation (387.1 mm) has surpassed the normal (311.2 mm) by 75.9 mm for the same period.

Total bright sunshine hours (114.6 hrs) as recorded by the Campbell-Stokes recorder was 60% of the normal, and the lowest on record since 1941.

Persistent below normal temperatures are reflected by the above normal number of heating degree days (260.5).

Soil temperatures at all depths were below normal (0.2° to 1.4°).

The month of September has been cool and extremely wet with below normal temperatures and above normal precipitation. Harvesting has come to a halt as a result of the frequent shower activity.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
OCTOBER, 1986

Table 11.

Element	1986 Value	1985 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	5.9	4.5	5.2	
Monthly Mean Maximum Temperature[5] (°C)	12.5	10.5	11.1	
Monthly Mean Minimum Temperature[6] (°C)	-0.8	-1.6	-0.8	
Extreme Maximum Temperature[7] (°C)	23.5	20.0	28.3	32.2
Year/Day(s)[20]	1986/17	1985/21	1964/13	1943/5
Years of Record[21]	1	1	17	87
Extreme Minimum Temperature[7] (°C)	-9.5	-9.5	-18.3	-25.6
Year/Day(s)[20]	1986/29,31	1985/15	1972/18	1919/26
Years of Record[21]	1	1	17	87
Days with Frost[8]	17	23	18	
Heating Degree-Days[9] (18°C base)	374.5	417.0	398.0	
Growing Degree-Days[10] (5°C base)	85.0	42.0	71.1	
Total Precipitation[11] (mm)	6.3	5.4	17.5	
Total Rainfall[11] (mm)	2.1	3.5	7.7	
Total Snowfall[12] (cm)	4.2	1.9	10.3	
Greatest 24-hour Precipitation (mm)	3.8	1.9	25.4	36.7
Year/Day(s)[20]	1986/28	1985/16	1969/2	1984/16
Years of Record[21]	1	1	17	87
Greatest 24-hour Rainfall (mm)	1.4	1.7	23.1	34.0
Year/Day(s)[20]	1986/5	1985/2	1969/2	1914/5
Years of Record[21]	1	1	17	87
Greatest 24-hour Snowfall (cm)	3.8	1.9	22.9	36.7
Year/Day(s)[20]	1986/28	1985/16	1969/3	1984/16
Years of Record[21]	1	1	17	87
Precipitation Days[13]	4	5	5	
Rainfall Days[13]	2	4	3	
Snowfall Days[13]	2	1	3	
Total Evaporation[14] (mm)	58.0*	7.0*	--	
Mean Wind Speed[15] (km/hr)	12.4	16.7**	18.0	
Peak Gust Speed[16] (km/hr)	58	69	138	
Total Bright Sunshine[17] (hr)	155.4	150.3	175.0	
Percent Possible Bright Sunshine[18]	47	46	53	
Total Global Radiation[19] (MJ m^{-2})	231.4	237.8	255.6	
Total Diffuse Radiation[19] (MJ m^{-2})	80.0	89.1	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	6.3, 8.4	4.5, 7.1	5.4, 8.0	
Mean Soil Temperature[22] (°C) (150, 300 cm)	9.5, 9.2	8.3, 8.7	9.8, 9.5	

* Evaporation program was discontinued after October 27, 1986 and October 3, 1985.
**25 days in 1985.

SUMMARY:

The mean temperature of 5.9°C was slightly above normal by 0.7°C. Extreme temperatures recorded at CRS ranged between a maximum of 23.5°C (on the 17th) and -9.5°C (on the 29th). Above normal temperatures were recorded on 16 of 31 days, 13 of which were consecutive. Below freezing temperatures were recorded on 17 days. This number is only one day less than the 1951-1980 normal.

The total precipitation (6.3 mm) fell substantially below the normal precipitation of 17.5 mm. Precipitation consisted of 2.1 mm of rain, and 4.2 cm of snow. The first snowfall (3.8 cm) was recorded on the 28th. The January to October precipitation of 393.4 mm exceeded the normal amount (328.7 mm) by 64.7 mm.

Bright sunshine hours (155.4 hrs) were below the normal by 19.6 hours. The mean wind speed (12.4 km/hr) was substantially below the normal of 18.0 km/hr.

Soil temperatures recorded at CRS were above normal at the 5 to 50 cm levels (by 0.5 to 1.2°), while below normal temperatures were recorded at the 100 to 300 cm levels (0.3 to 0.4°).

October has been a reasonably mild and dry month with above normal temperatures and below normal precipitation.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
NOVEMBER, 1986

Table 12.

Element	1986 Value	1985 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	-8.7	-15.4	-5.5	
Monthly Mean Maximum Temperature[5] (°C)	-4.6	-10.6	-1.0	
Monthly Mean Minimum Temperature[6] (°C)	-12.8	-20.1	-10.0	
Extreme Maximum Temperature[7] (°C)	9.5	7.0	19.4	21.7
Year/Day(s)[20]	1986/4	1985/1	1975/4	1903/3
Years of Record[21]	1	1	18	88
Extreme Minimum Temperature[7] (°C)	-22.5	-33.5	-32.8	-39.4
Year/Day(s)[20]	1986/15 &20	1985/24	1970/27	1893/30
Years of Record[21]	1	1	18	88
Days with Frost[8]	29	30	29	
Heating Degree-Days[9] (18°C base)	804.5	1002.5	704.4	
Growing Degree-Days[10] (5°C base)	0.5	0.0	2.6	
Total Precipitation[11] (mm)	15.9	9.8	16.0	
Total Rainfall[11] (mm)	3.1	2.4	2.5	
Total Snowfall[12] (cm)	12.8	7.4	12.3	
Greatest 24-hour Precipitation (mm)	7.3	3.0	19.3	27.9
Year/Day(s)[20]	1986/18	1985/4	1978/4	1938/1
Years of Record[21]	1	1	18	88
Greatest 24-hour Rainfall (mm)	2.4	1.6	14.5	14.5
Year/Day(s)[20]	1986/2	1985/4	1978/4	1978/4
Years of Record[21]	1	1	18	88
Greatest 24-hour Snowfall (cm)	7.3	1.5	13.2	27.9
Year/Day(s)[20]	1986/18	1985/25	1966/16	1938/1
Years of Record[21]	1	1	18	88
Precipitation Days[13]	8	10	9	
Rainfall Days[13]	3	2	1	
Snowfall Days[13]	5	9	8	
Total Evaporation[14] (mm)	--	--	--	
Mean Wind Speed[15] (km/hr)	13.1	11.1	16.9	
Peak Gust Speed[16] (km/hr)	70.0	57.0	100.0	
Total Bright Sunshine[17] (hr)	84.3	89.5	109.0	
Percent Possible Bright Sunshine[18]	32	34	41	
Total Global Radiation[19] (MJ m^{-2})	121.5	137.7	129.3	
Total Diffuse Radiation[19] (MJ m^{-2})	61.4	77.4	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	-1.2, 2.8	-6.1, -2.1	-1.7, 2.5	
Mean Soil Temperature[22] (°C) (150, 300 cm)	6.7, 7.8	5.7, 7.3	6.9, 8.1	

SUMMARY:

Although temperatures were not as low as November, 1985, temperatures were again below normal. The mean temperature of -8.7°C was 3.2°C below the normal (-5.5°C), while extreme maxima ranged from -16.5° to 9.5°C and extreme minima ranged from -22.5° to 1.5°C. Below normal temperatures were recorded on 15 consecutive days (November 8 to 22) producing the second longest cool spell this year. Above normal temperatures were recorded during the first and last week of the month.

Total precipitation (15.9 mm) was slightly below the normal (16.0 mm) and consisted of 12.8 cm of snow and 3.1 mm of rain. The total annual precipitation to date (409.3 mm) continues to be above the normal (by 64.6 mm).

Below normal temperatures were reflected in an above normal number of heating degree days.

Mean soil temperatures at the 5 cm to 50 cm depths were above normal, while temperatures at the 100 cm to 300 cm levels were slightly below normal. Soil temperatures at the 5 to 20 cm depths were all below freezing by the end of the month.

With the exception of the first and last week, November has been a cold month with normal precipitation. November's below normal temperatures were a possible indication of winter yet to come.

SASKATCHEWAN RESEARCH COUNCIL
CLIMATE REFERENCE STATION
LOCATION: 52°09'N 106°36'W 497 m MSL
MONTHLY WEATHER SUMMARY FOR
DECEMBER, 1986

Table 13.

Element	1986 Value	1985 Value	Mean or Extreme Value 1951-1980[2]	Extreme All Years[3]
Monthly Mean Temperature[4] (°C)	-8.4	-12.6	-13.9	
Monthly Mean Maximum Temperature[5] (°C)	-3.3	-7.3	-9.3	
Monthly Mean Minimum Temperature[6] (°C)	-13.5	-17.9	-18.5	
Extreme Maximum Temperature[7] (°C)	3.0	6.0	8.0	13.3
Year/Day(s)[20]	1986/1, 23	1985/21	1980/27	1939/5
Years of Record[21]	1	1	18	88
Extreme Minimum Temperature[7] (°C)	-30.0	-30.5	-42.2	-43.9
Year/Day(s)[20]	1986/12	1985/1	1973/31	1892/22
Years of Record[21]	1	1	18	88
Days with Frost[8]	31	31	31	
Heating Degree-Days[9] (18°C base)	821.5	928.5	992.0	
Growing Degree-Days[10] (5°C base)	0.0	0.0	0.0	
Total Precipitation[11] (mm)	2.8	14.6	25.8	
Total Rainfall[11] (mm)	0.0	T	0.8	
Total Snowfall[12] (cm)	2.8	14.6	23.1	
Greatest 24-hour Precipitation (mm)	1.4	2.3	14.5	20.6
Year/Day(s)[20]	1986/1	1985/18	1973/23	1936/24
Years of Record[21]	1	1	18	87
Greatest 24-hour Rainfall (mm)	0.0	T	4.3	4.8
Year/Day(s)[20]	--	1985/22	1979/6	1956/26
Years of Record[21]	1	1	18	88
Greatest 24-hour Snowfall (cm)	1.4	2.3	14.5	20.6
Year/Day(s)[20]	1986/1	1985/18	1973/23	1936/24
Years of Record[21]	1	1	18	88
Precipitation Days[13]	5	15	13	
Rainfall Days[13]	0	--	1	
Snowfall Days[13]	5	15	12	
Total Evaporation[14] (mm)	--	--	--	
Mean Wind Speed[15] (km/hr)	12.9	13.7	16.8	
Peak Gust Speed[16] (km/hr)	67	82	97	
Total Bright Sunshine[17] (hr)	83.8	67.9	86.0	
Percent Possible Bright Sunshine[18]	35	28	36	
Total Global Radiation[19] (MJ m^{-2})	92.9	88.6	96.0	
Total Diffuse Radiation[19] (MJ m^{-2})	42.5	56.2	--	
Mean Soil Temperature[22] (°C) (10, 50 cm)	-3.9, -0.5	-8.5, -3.7	-6.6, -1.8	
Mean Soil Temperature[22] (°C) (150, 300 cm)	4.0, 6.2	1.7, 5.2	3.9, 6.2	

SUMMARY:

The mean temperature (-8.4°C) was above the normal by 5.5°C making December the fourth warmest on record since 1941. Above normal temperatures were recorded on 25 of 31 days, while 19 were consecutive between December 13 and 31. Temperatures ranged between a maximum of 3.0°C (on the 1st and 23rd) to a minimum of -30.0°C (on the 12th).

Monthly total precipitation (2.8 mm) recorded at CRS was only about one-tenth of the 1951-1980 normal (25.8 mm). However, the total annual precipitation (412.1 mm) surpasses the normal (370.5 mm) by 41.6 mm.

Soil temperatures at the 5 cm to 150 cm levels were above normal (by 0.3° to 3.3°C), while the temperature at the 300 cm depth was normal.

Bright sunshine hours (83.8 hrs) as measured by the Campbell-Stokes sunshine recorder were slightly below the normal (86.0 hrs).

As in 1985, December has been a mild and dry month with above normal temperatures and below normal precipitation. December's mean temperature (-8.4°C) was slightly above the November mean temperature (-8.7°C).

Table 14. Soil Temperature and Snow Cover at Saskatoon SRC, January 1986.

Depth (cm)	Mean Temp.[a] (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	-5.3	8.5	31	1	5
10	-4.9	8.0	31	5	8
20	-4.2	7.0	31	10	T
50	-2.8	2.0	31	15	T (7 cm on the 18th)
100	-0.7	0.5	31	20	7
150	0.7	0.5	0	25	4
300	3.4	1.0	0	31	8

[a] - one day of missing data

T - indicates a trace

Table 15. Soil Temperature and Snow Cover at Saskatoon SRC, February 1986.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	-8.2	11.0	28	1	8
10	-7.8	9.5	28	5	7
20	-6.8	9.0	28	10	7
50	-4.3	3.0	28	15	7
100	-1.0	1.0	28	20	9
150	0.4	0.5	0	25	9
300	2.7	0.5	0	28	3

Table 16. Soil Temperature and Snow Cover at Saskatoon SRC, March 1986.

Depth (cm)	Mean Temp.[a] (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	-0.2	12.5	23	1	0
10	-0.1	11.0	12	5	0
20	0.0	10.0	18	10	2
50	-0.5	4.0	12	15	0
100	-0.2	1.5	30	20	0
150	0.1	0.5	27	25	6
300	2.2	0.5	0	31	0

[a] - one day of missing data

Table 17. Soil Temperature and Snow Cover at Saskatoon SRC, April 1986.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	4.5	11.0	0	1	0
10	4.6	10.0	0	5	0
20	4.2	8.5	0	10	0
50	2.6	5.5	0	15	0
100	0.8	3.5	18	20	0
150	0.9	2.0	0	25	0
300	2.0	0.5	0	30	0

Table 18. Soil Temperature and Snow Cover at Saskatoon SRC, May 1986.

Depth (cm)	Mean Temp.[a] (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	12.1	18.0	0	1	0
10	11.9	17.0	0	5	0
20	11.0	12.5	0	10	0
50	8.5	8.0	0	15	0
100	5.7	5.5	0	20	0
150	4.2	3.5	0	25	0
300	3.0	1.5	0	31	0

[a] - one day of missing data

Table 19. Soil Temperature and Snow Cover at Saskatoon SRC, June 1986.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	17.5	10.0	0	1	0
10	17.8	12.0	0	5	0
20	17.3	6.5	0	10	0
50	14.7	3.0	0	15	0
100	10.5	2.5	0	20	0
150	8.4	3.5	0	25	0
300	5.1	2.0	0	30	0

Table 20. Soil Temperature and Snow Cover at Saskatoon SRC, July 1986.

Depth (cm)	Mean Temp.[a] (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	18.3	7.5	0	1	0
10	18.8	8.0	0	5	0
20	18.5	4.5	0	10	0
50	16.5	2.0	0	15	0
100	12.7	1.5	0	20	0
150	10.7	2.0	0	25	0
300	7.1	2.0	0	31	0

[a] - one day of missing data

Table 21. Soil Temperature and Snow Cover at Saskatoon SRC, August 1986.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	17.8	8.0	0	1	0
10	18.2	8.0	0	5	0
20	18.1	4.5	0	10	0
50	16.8	1.5	0	15	0
100	13.6	0.5	0	20	0
150	12.0	1.0	0	25	0
300	8.7	1.5	0	31	0

Table 22. Soil Temperature and Snow Cover at Saskatoon SRC, September 1986.

Depth (cm)	Mean Temp.[a] (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	10.6	11.5	0	1	0
10	11.2	11.0	0	5	0
20	12.1	7.5	0	10	0
50	13.0	5.5	0	15	0
100	12.0	3.0	0	20	0
150	11.7	2.0	0	25	0
300	9.7	0.5	0	30	0

[a] - one day of missing data

Table 23. Soil Temperature and Snow Cover at Saskatoon SRC, October 1986.

Depth (cm)	Mean Temp. (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	5.6	8.0	0	1	0
10	6.3	8.0	0	5	0
20	7.3	6.0	0	10	0
50	8.4	4.0	0	15	0
100	8.9	3.0	0	20	0
150	9.5	2.0	0	25	0 (3 cm on the 29th)
300	9.2	1.5	0	31	T

T - indicates a trace

Table 24. Soil Temperature and Snow Cover at Saskatoon SRC, November 1986.

Depth (cm)	Mean Temp.[a] (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	-1.9	6.5	26	1	T
10	-1.2	6.5	23	5	0
20	0.5	6.0	19	10	1
50	2.8	5.0	0	15	2
100	5.1	4.0	0	20	5
150	6.7	3.5	0	25	2
300	7.8	1.5	0	30	T

[a] - three days of missing data

T - indicates a trace

Table 25. Soil Temperature and Snow Cover at Saskatoon SRC, December 1986.

Depth (cm)	Mean Temp.[b] (°C)	Range (°C)	Frost Days	Date	Snow Depth (cm)
5	-4.5	6.0	31	1	T
10	-3.9	6.5	31	5	3
20	-2.4	5.0	31	10	3
50	-0.5	2.5	23	15	4
100	2.1	2.5	0	20	4
150	4.0	2.0	0	25	4
300	6.2	2.0	0	31	7

[b] - four days of missing data

T - indicates a trace

Table 26. Diffuse Solar Radiation (MJ m^{-2}) at Saskatoon SRC, 1986.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.8	2.9	4.0	5.0	9.5	6.1	4.0	9.8	2.3	4.0	1.2	0.9
2	2.2	2.4	6.0	5.9	6.6	16.5	8.1	4.6	7.0	6.1	1.6	1.7
3	1.9	2.7	4.8	5.9	9.0	7.0	9.5	4.3	6.1	4.2	1.6	1.0
4	1.3	3.0	4.7	6.4	5.9	7.5	4.7	9.7	6.4	3.8	1.8	1.6
5	1.2	2.1	5.2	6.4	3.0	10.2	11.4	5.9	6.6	3.7	2.6	2.2
6	1.3	4.1	5.0	6.8	10.0	9.3	10.5	7.3	1.9	5.2	2.2	1.6
7	2.0	2.3	5.0	5.8	6.3	5.0	7.6	4.1	1.6	2.9	2.3	1.5
8	2.3	4.0	5.9	6.1	7.5	8.4	4.2	7.8	5.1	1.9	2.6	2.1
9	1.2	3.4	M	5.6	2.2	5.8	9.9	9.0	6.9	5.0	2.7	1.1
10	1.2	3.5	2.7	7.8	10.0	4.3	6.2	2.0	4.1	1.7	1.2	1.0
11	1.1	2.8	7.1	6.6	2.1	5.8	8.8	4.9	4.9	1.7	2.7	1.1
12	1.7	4.6	4.9	5.3	6.0	7.1	9.8	4.0	6.5	1.4	1.2	1.6
13	1.7	2.2	3.2	6.6	8.4	6.2	7.8	6.0	5.4	1.3	2.1	2.4
14	2.6	3.2	6.2	7.8	9.8	5.7	5.1	6.5	M	3.4	2.8	0.9
15	2.8	5.2	5.1	6.0	7.1	5.4	6.9	4.2	2.0	3.0	2.4	0.9
16	1.4	4.9	6.2	9.5	10.5	8.9	6.3	4.7	3.6	1.4	3.0	2.0
17	0.6	5.3	5.1	8.4	10.2	3.1	4.9	3.2	3.9	1.4	3.9	2.1
18	2.1	4.9	5.1	5.5	7.7	4.1	6.3	3.4	4.3	1.8	2.8	0.8
19	2.2	5.5	6.5	7.9	3.9	7.5	5.8	4.1	3.7	2.8	1.4	1.4
20	2.2	5.4	6.5	7.3	3.5	7.4	4.2	3.4	2.3	2.9	1.6	1.0

Table 26. (Continued)

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
21	2.6	4.9	7.4	8.5	9.4	8.7	6.8	5.1	3.2	1.8	2.7	1.4
22	3.1	4.0	5.8	5.3	4.9	10.6	6.6	2.3	6.7	1.8	2.7	1.6
23	2.0	5.9	7.1	6.9	8.5	5.5	9.6	5.6	6.2	1.1	1.9	1.6
24	2.3	4.7	4.6	6.1	10.3	4.1	5.4	4.0	3.6	1.3	1.2	1.2
25	2.2	4.7	9.8	7.5	6.5	4.2	7.8	7.9	1.4	1.5	1.7	0.8
26	3.5	3.6	9.7	4.7	2.9	8.8	8.0	5.8	5.7	1.8	2.7	1.6
27	2.7	2.9	7.9	5.6	2.5	9.3	6.7	2.3	1.6	3.0	1.7	0.8
28	3.5	5.9	7.8	9.7	3.2	6.3	8.8	2.4	3.3	2.3	1.2	0.8
29	4.1		6.2	7.4	3.7	12.2	8.7	3.8	4.6	3.0	0.8	2.1
30	2.9		7.0	9.0	4.5	4.8	7.5	5.4	3.3	0.4	1.1	0.7
31	2.7		5.4		3.3		8.2	5.1		2.4		1.0
Total Diffuse	66.3	111.0	177.9	203.3	198.9	215.8	226.1	158.6	124.2	80.0	61.4	42.5
Total Global	114.1	222.9	299.4	466.4	579.7	651.9	607.4	578.1	285.5	231.4	121.5	92.9

Note: M means missing values.

Table 27. Some Significant Climatic Events, 1986.

FROST FREE SEASON

	Last Spring Frost	First Fall Frost	Length of Season
1986	May 17	September 6	111
1985	June 4	September 6	93

SNOW SEASON

Greatest Depth of Snow on Ground (cm)

	Jan.	Feb.	Mar.	Apr.	Oct.	Nov.	Dec.
1986	13	10	6	0	3	6	7
1985	19	32	33	10	5	6	11

	Cessation[1] of Snow Pack	Last Spring Snowfall	First Fall Snow	Onset[2] of Snow Pack
1986	March 1	April 2	October 28	November 14
1985	April 7	April 16	September 22	November 5

WEATHER "SPELLS"[3,4]

	1986	1985
Longest Cool Spell:	17 days, Feb. 7-23	19 days, Nov. 16-Dec. 4
Longest Warm Spell:	31 days, Jan. 7-Feb. 6	18 days, Mar. 5-22
Longest Dry Spell:	20 days, Aug. 10-29 and Oct. 8-27	17 days, Oct. 17-Nov. 2
Longest Wet Spell:	9 days, July 9-17	5 days, May 28-June 1

[1]First day on the first interval of at least 5 days duration in which snow cover is reduced to less than 1 cm depth.

[2]First day on the first interval of at least 5 days duration in which snow cover equals or exceeds 1 cm depth.

[3]Temperature "spells" are defined as a sequence of days when the daily mean temperature during the year in question is higher (warm spell) or lower (cold spell) than the long-term daily mean for the date in question.

[4]Precipitation "spells" are defined as the sequence of days with precipitation amounts greater than trace (wet spells) or precipitation amounts of trace or less (dry spells).

Table 28. Times of Sunrise at Saskatoon, 1986.

DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	9.16	8.48	7.54	6.43	5.38	4.52	4.50	5.27	6.17	7.07	8.01	8.52
2	9.16	8.47	7.52	6.41	5.36	4.51	4.50	5.28	6.19	7.08	8.03	8.54
3	9.16	8.45	7.50	6.38	5.34	4.51	4.51	5.30	6.20	7.10	8.05	8.55
4	9.15	8.43	7.48	6.36	5.32	4.50	4.52	5.32	6.22	7.12	8.06	8.56
5	9.15	8.42	7.45	6.34	5.30	4.49	4.53	5.33	6.24	7.13	8.08	8.58
6	9.15	8.40	7.43	6.31	5.28	4.49	4.54	5.35	6.25	7.15	8.10	8.59
7	9.14	8.38	7.41	6.29	5.26	4.48	4.55	5.36	6.27	7.17	8.12	9.00
8	9.14	8.37	7.39	6.27	5.25	4.47	4.55	5.38	6.29	7.18	8.14	9.01
9	9.13	8.35	7.36	6.25	5.23	4.47	4.56	5.40	6.30	7.20	8.15	9.03
10	9.13	8.33	7.34	6.22	5.21	4.47	4.57	5.41	6.32	7.22	8.17	9.04
11	9.12	8.31	7.32	6.20	5.19	4.46	4.59	5.43	6.34	7.24	8.19	9.05
12	9.12	8.29	7.29	6.18	5.18	4.46	5.00	5.44	6.35	7.25	8.21	9.06
13	9.11	8.27	7.27	6.16	5.16	4.46	5.01	5.46	6.37	7.27	8.23	9.07
14	9.10	8.25	7.25	6.13	5.15	4.45	5.02	5.48	6.38	7.29	8.24	9.08
15	9.09	8.23	7.23	6.11	5.13	4.45	5.03	5.49	6.40	7.31	8.26	9.09
16	9.08	8.22	7.20	6.09	5.11	4.45	5.04	5.51	6.42	7.32	8.28	9.10
17	9.07	8.20	7.18	6.07	5.10	4.45	5.06	5.53	6.43	7.34	8.30	9.10
18	9.06	8.18	7.16	6.05	5.09	4.45	5.07	5.54	6.45	7.36	8.31	9.11
19	9.05	8.15	7.13	6.02	5.07	4.45	5.08	5.56	6.47	7.38	8.33	9.12
20	9.04	8.13	7.11	6.00	5.06	4.45	5.09	5.57	6.48	7.39	8.35	9.13
21	9.03	8.11	7.09	5.58	5.04	4.45	5.11	5.59	6.50	7.41	8.36	9.13
22	9.02	8.09	7.06	5.56	5.03	4.46	5.12	6.01	6.52	7.43	8.38	9.14
23	9.01	8.07	7.04	5.54	5.02	4.46	5.14	6.02	6.53	7.45	8.40	9.14
24	9.00	8.05	7.02	5.52	5.01	4.46	5.15	6.04	6.55	7.46	8.41	9.15
25	8.58	8.03	6.59	5.50	4.59	4.47	5.16	6.06	6.57	7.48	8.43	9.15
26	8.57	8.01	6.57	5.48	4.58	4.47	5.18	6.07	6.58	7.50	8.45	9.15
27	8.56	7.59	6.55	5.46	4.57	4.47	5.19	6.09	7.00	7.52	8.46	9.15
28	8.54	7.56	6.52	5.44	4.56	4.48	5.21	6.11	7.02	7.54	8.48	9.16
29	8.53	0.00	6.50	5.42	4.55	4.48	5.22	6.12	7.03	7.55	8.49	9.16
30	8.51	0.00	6.48	5.40	4.54	4.49	5.24	6.14	7.05	7.57	8.51	9.16
31	8.50	0.00	6.45	0.00	4.53	0.00	5.25	6.15	0.00	7.59	0.00	9.16

Note: Local standard time is given in hours and minutes according to the 24-hour notation.

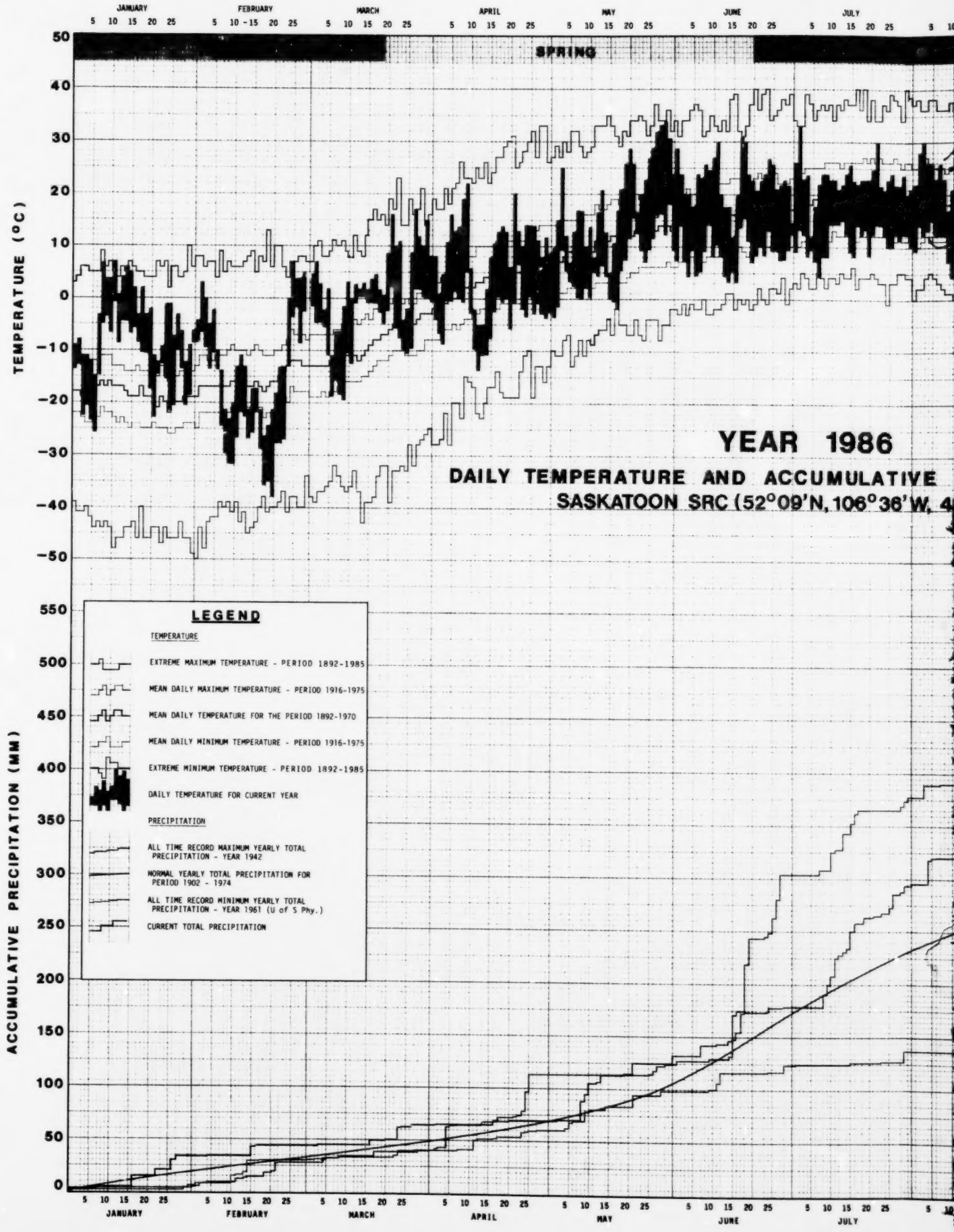
Table 29. Times of Sunset at Saskatoon, 1986.

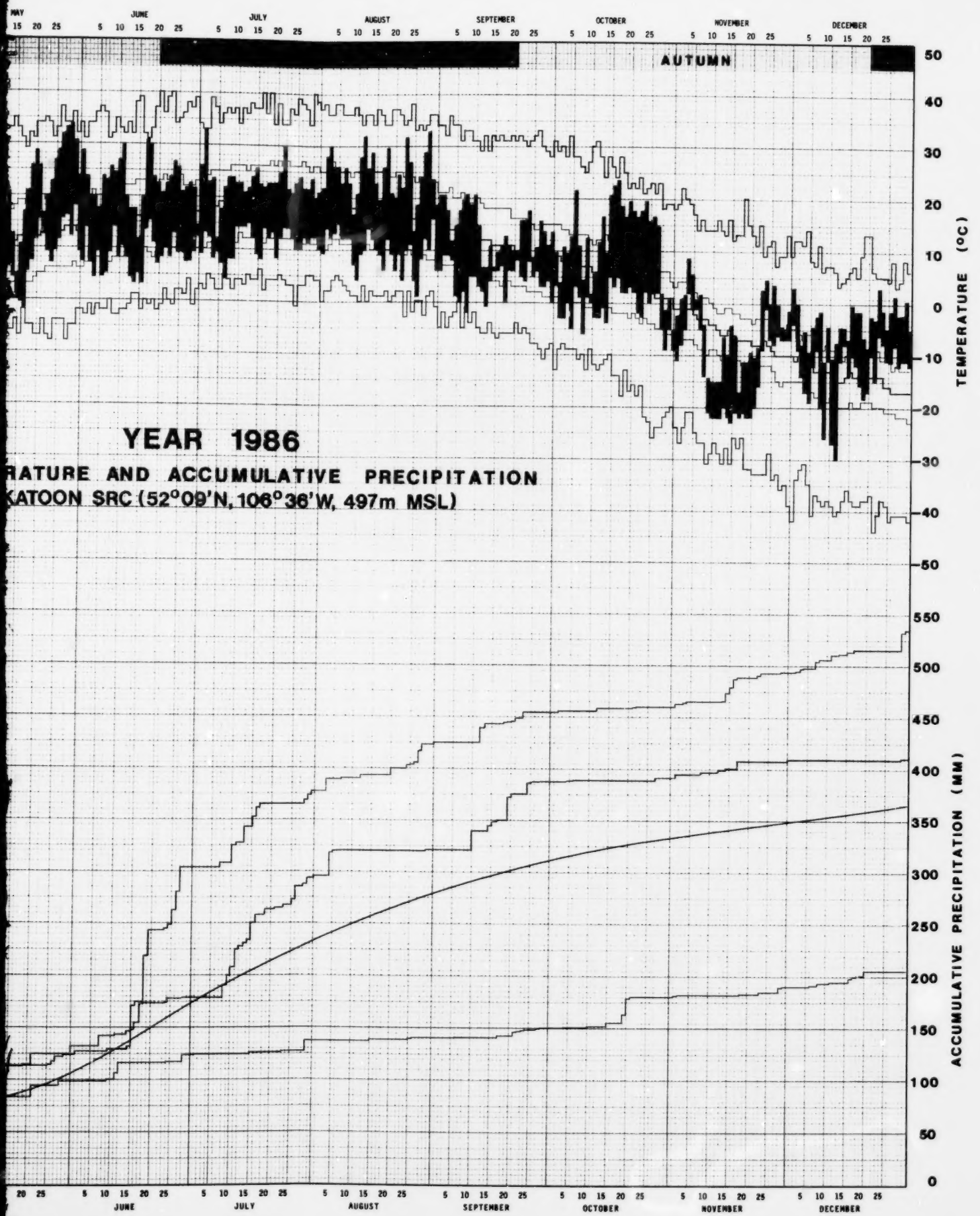
DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	17.04	17.52	18.44	19.39	20.30	21.17	21.31	20.59	19.57	18.47	17.40	16.59
2	17.05	17.54	18.46	19.40	20.32	21.18	21.31	20.58	19.55	18.44	17.38	16.58
3	17.06	17.56	18.48	19.42	20.34	21.19	21.30	20.56	19.52	18.42	17.36	16.58
4	17.07	17.58	18.50	19.44	20.35	21.20	21.30	20.54	19.50	18.40	17.34	16.57
5	17.09	18.00	18.52	19.46	20.37	21.21	21.30	20.52	19.48	18.37	17.33	16.56
6	17.10	18.02	18.53	19.47	20.39	21.22	21.29	20.51	19.45	18.35	17.31	16.56
7	17.11	18.03	18.55	19.49	20.40	21.23	21.29	20.49	19.43	18.33	17.29	16.56
8	17.12	18.05	18.57	19.51	20.42	21.24	21.28	20.47	19.41	18.31	17.27	16.55
9	17.14	18.07	18.59	19.53	20.44	21.25	21.27	20.45	19.38	18.28	17.26	16.55
10	17.15	18.09	19.00	19.54	20.45	21.25	21.26	20.43	19.36	18.26	17.24	16.55
11	17.17	18.11	19.02	19.56	20.47	21.26	21.26	20.41	19.34	18.24	17.22	16.54
12	17.18	18.13	19.04	19.58	20.48	21.27	21.25	20.39	19.31	18.22	17.21	16.54
13	17.20	18.15	19.06	19.59	20.50	21.28	21.24	20.37	19.29	18.19	17.19	16.54
14	17.21	18.17	19.08	20.01	20.52	21.28	21.23	20.35	19.27	18.17	17.18	16.54
15	17.23	18.18	19.09	20.03	20.53	21.29	21.22	20.33	19.24	18.15	17.16	16.54
16	17.24	18.20	19.11	20.05	20.55	21.29	21.21	20.31	19.22	18.13	17.15	16.54
17	17.26	18.22	19.13	20.06	20.56	21.30	21.20	20.29	19.20	18.10	17.14	16.55
18	17.27	18.24	19.15	20.08	20.58	21.30	21.19	20.27	19.17	18.08	17.12	16.55
19	17.29	18.26	19.16	20.10	20.59	21.31	21.18	20.25	19.15	18.06	17.11	16.55
20	17.31	18.28	19.18	20.11	21.01	21.31	21.17	20.23	19.13	18.04	17.10	16.55
21	17.32	18.30	19.20	20.13	21.02	21.31	21.15	20.21	19.10	18.02	17.08	16.56
22	17.34	18.31	19.22	20.15	21.04	21.32	21.14	20.19	19.08	18.00	17.07	16.56
23	17.36	18.33	19.23	20.17	21.05	21.32	21.13	20.17	19.05	17.58	17.06	16.57
24	17.38	18.35	19.25	20.18	21.06	21.32	21.11	20.15	19.03	17.56	17.05	16.57
25	17.39	18.37	19.27	20.20	21.08	21.32	21.10	20.12	19.01	17.54	17.04	16.58
26	17.41	18.39	19.28	20.22	21.09	21.32	21.09	20.10	18.58	17.52	17.03	16.59
27	17.43	18.41	19.30	20.23	21.10	21.32	21.07	20.08	18.56	17.50	17.02	16.59
28	17.45	18.42	19.32	20.25	21.12	21.32	21.06	20.06	18.54	17.48	17.01	17.00
29	17.47	0.00	19.34	20.27	21.13	21.32	21.04	20.04	18.51	17.46	17.00	17.01
30	17.49	0.00	19.35	20.29	21.14	21.31	21.03	20.01	18.49	17.44	17.00	17.02
31	17.50	0.00	19.37	0.00	21.15	0.00	21.01	19.59	0.00	17.42	0.00	17.03

Note: Local standard time is given in hours and minutes according to the 24-hour notation.

Figure 1. Year 1986 Daily Temperature and Cumulative Precipitation.

In order to present the maximum length of climatic record for the Saskatoon area, data from several sources have been pooled to produce the historic record shown in this figure. For data sources please refer to Footnotes for Climatic Tables, note 3. The seasons shown are defined on an astronomical basis.


JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
SPRING
TEMPERATURE (°C)
ACCUMULATIVE PRECIPITATION (MM)
YEAR 1986
DAILY TEMPERATURE AND ACCUMULATIVE
SASKATOON SRC (52°09'N, 106°36'W, 4
LEGEND
TEMPERATURE
EXTREME MAXIMUM TEMPERATURE - PERIOD 1892-1985
MEAN DAILY MAXIMUM TEMPERATURE - PERIOD 1916-1975
MEAN DAILY TEMPERATURE FOR THE PERIOD 1892-1970
MEAN DAILY MINIMUM TEMPERATURE - PERIOD 1916-1975
EXTREME MINIMUM TEMPERATURE - PERIOD 1892-1985
DAILY TEMPERATURE FOR CURRENT YEAR
PRECIPITATION
ALL TIME RECORD MAXIMUM YEARLY TOTAL PRECIPITATION - YEAR 1942
NORMAL YEARLY TOTAL PRECIPITATION FOR PERIOD 1902 - 1974
ALL TIME RECORD MINIMUM YEARLY TOTAL PRECIPITATION - YEAR 1961 (U of S Phy.)
CURRENT TOTAL PRECIPITATION


MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
AUTUMN
TEMPERATURE (°C)
ACCUMULATIVE PRECIPITATION (MM)
YEAR 1986
RATURE AND ACCUMULATIVE PRECIPITATION
KATOON SRC (52°09'N, 106°36'W, 497m MSL)